

06-26-00

A

NEW, CONTINUATION, DIVISIONAL OR
CONTINUATION-IN-PART APPLICATION
UNDER 37 C.F.R. §1.53(b)

Attorney Docket No. BRI-00039Express Mail Label No. EK 343 206 190 USDate June 23, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Hon. Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

Transmitted herewith for filing under 37 C.F.R. §1.53(b) is a patent application for

"EXTERIOR MIRROR FOR MOTOR VEHICLE"

identified by: ☐ First named inventor _____
or ☒ Attorney Docket No. (see above)

1. Type of Application

☒ This application is a new (non-continuing) application.

☐ This application is a ☐ continuation / ☐ divisional / ☐ continuation-in-part of prior application No. _____. Amend the specification by inserting before the first line the sentence:

—This is a [continuation/division/continuation-in-part] of United States patent application No. _____, filed _____.

☐ The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

If for some reason applicant has not requested a sufficient extension of time in the parent application, and/or has not paid a sufficient fee for any necessary response in the parent application and/or for the extension of time necessary to prevent the abandonment of the parent application prior to the filing of this application, please consider this as a Request for an Extension for the required time period and/or authorization to charge our Deposit Account No. 500906 (Britax Intellectual Property Group) for any fee that may be due. THIS FORM IS BEING FILED IN TRIPLICATE: one copy for this application; one copy for use in connection with the Deposit Account (if applicable); and one copy for the above-mentioned parent application (if any extension of time is necessary).

2. Contents of Application

a. ☒ Specification of 10 pages;

☐ A microfiche computer program (Appendix);

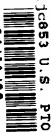
☐ A nucleotide and/or amino acid sequence submission;

☐ Because the enclosed application is in a non-English language, a verified English translation ☐ is enclosed ☐ will be filed.

☐ Cancel original claims _____ of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing date purposes.)

b. ☒ Drawings on 2 sheets;

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jc853 U.S. PTO
09/602923



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- c. ☒ A signed Oath/Declaration ☒ is enclosed / ☐ will be filed in accordance with 37 C.F.R. §1.53(f).

The enclosed Oath/Declaration is ☒ newly executed / ☐ a copy from a prior application under 37 C.F.R. §1.63(d) / ☐ accompanied by a statement requesting the deletion of person(s) not inventors in the continuing application.

d. **Fees**

FILING FEE	Number	Number		Basic Fee
CALCULATION	Filed	Extra	Rate	\$690.00
Total Claims	14 - 20 =	0 ×	\$18.00 =	0.00
Independent Claims	1 - 3 =	0 ×	\$78.00 =	0.00
Multiple Dependent Claim(s) Used			\$260.00 =	0
FILING FEE - NON-SMALL ENTITY				\$690.00
FILING FEE - SMALL ENTITY: Reduction by 1/2				0
<input type="checkbox"/> Verified Statement under 37 C.F.R. §1.27 is enclosed.				
<input type="checkbox"/> Verified Statement filed in prior application.				
Assignment Recordal Fee (\$40.00)				0
37 C.F.R. §1.17(k) Fee (non-English application)				0
TOTAL				\$690.00

- ☐ A check is enclosed to cover the calculated fees. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 500906 (Britax Intellectual Property Group). A duplicate copy of this document is enclosed.

- ☐ The calculated fees will be paid within the time allotted for completion of the filing requirements.

- ☒ The calculated fees are to be charged to Deposit Account No. 500906 (Britax Intellectual Property Group). The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to said Deposit Account. A duplicate copy of this document is enclosed.

3. **Priority Information**

- ☐ **Foreign Priority:** Priority based on _____ Application No. _____, filed _____, is claimed.

- ☐ A copy of the above referenced priority document ☐ is enclosed / ☐ will be filed in due course, pursuant to 35 U.S.C. §119(a)-(d).

- ☐ **Provisional Application Priority:** Priority based on United States Provisional Application No. _____, filed _____, is claimed under 35 U.S.C. §119(e).

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4. **Other Submissions**

- ☐ A Preliminary Amendment is enclosed.
- ☐ An Information Disclosure Statement, _____ sheets of PTO Form 1449, and _____ patent(s)/publications/documents are enclosed.
- ☒ A power of attorney
- ☒ is submitted ☒ with the new Oath/Declaration.
- ☐ is of record in the prior application and ☐ is in the original papers / ☐ a copy is enclosed.
- ☐ An Assignment of the invention
- ☐ is enclosed with a cover sheet pursuant to 37 C.F.R. §§3.11, 3.28 and 3.31.
- ☐ is of record in a prior application. The assignment is to _____, and is recorded at Reel _____, Frame(s) _____.
- ☐ An Establishment of Assignee's Right To Prosecute Application Under 37 C.F.R. §3.73(b), and Power Of Attorney is enclosed.
- ☒ An Express Mailing Certificate is enclosed.
- ☒ Other: Return Receipt Postcard
- _____
- _____

Attention is directed to the fact that the correspondence address for this application is:

Warn IP Law Office
P.O. Box 70098
Rochester Hills, Michigan 48307
(248) 627-1133.

Respectfully,


Philip R. Warn
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Date June 23, 2000
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EXTERIOR MIRROR FOR MOTOR VEHICLE

FIELD

This invention relates to an exterior rear view mirror for a vehicle.

5 RELATED ART

EP-A-0209296 discloses an exterior mirror for a vehicle having a mirror comprising a base member for mounting on a vehicle body, a housing pivotally mounted on the base for angular movement about a first pivot axis, a reflective member pivotally mounted in the housing for angular movement relative thereto only about a second pivot axis and electrically operated drive means for causing angular movement of the housing about first pivot axis and angular movement of the reflective member relative to the housing about the second pivot axis.

EP-A-0881124 discloses an exterior mirror for a vehicle having a mirror head which can be moved from a deployed position for normal driving to a parked position in which it lies closely adjacent to the vehicle body and thus is less liable to damage when the vehicle is not in use.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an exterior vehicle mirror in which the same mechanism is used both to adjust the orientation of the mirror head about a first axis, in order to provide the driver with a required field of view, and to move the mirror head between a deployed position and a parked position.

According to the invention, an exterior rear view mirror for a vehicle comprises a base for mounting on a vehicle body, a housing pivotally mounted on the base for angular movement about a first pivot axis, a reflective member mounted in the housing, an electric motor having an

output shaft arrange to cause angular movement of the housing about the first pivot axis, and a controller adapted to control the electric motor so as to selectively drive the housing about the first axis either at a first speed or at a second speed which is faster than the first speed.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partially broken-away elevational view of a rear view mirror in accordance with the invention from the side of the housing on which the reflective member is exposed;

Figure 2 is a cross-sectional view taken on the line 2-2 in Figure 1; and

Figure 3 is a block diagram illustrating the control system for the mirror shown in Figures 1 and 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figures 1 and 2 illustrate a rear-view mirror having a base member 10 adapted to be mounted on the body of a vehicle. The base member 10 has a flat upper wall 12 which abuts against a flat lower wall of a mirror housing 16.

Within the housing 16, a reflective member 18 is secured to a mirror carrier 20 with integrally formed rearwardly extending brackets 22 and 24 which are journaled on a shaft 26. The shaft 26 is mounted on ribs 28 and 30 which are formed integrally with the housing 16. As can be seen from Figure 2, the reflective member 18 comprises a prism oriented so that its upper edge is wider than its lower edge, the angle between its two faces preferably being between 1° and 3° . The prism 18 has a reflective layer on its surface abutting the mirror carrier 20. At night, if the driver of a following car fails to dip his headlights, the mirror carrier 20 can be tilted through the angle between the faces of the prism (i.e. between 1° and 3°) so that a driver of the vehicle sees an

image reflected from the front surface of the prism 18 which is dimmer than the image which would have been reflected by the reflective layer.

5 A mounting member 32 extends between the ribs 28 and 30 and has two electric motors 34 and 36 mounted thereon. A worm gear 38 is mounted on the output shaft 39 of the motor 34. The worm gear 38 engages with a pinion 40 forming part of a screw jack drive 42 of the type described in EP-A-0549173. A jacking screw 44 projects through a
10 flexible synthetic rubber boot 46 on one end of the screw jack drive 42. A spherical formation 48 on the end of the jacking screw 44 engages in a complementary socket 49 on the inside surface of the mirror carrier 20. Thus, rotation of the worm gear 38 causes adjustment of the orientation of the reflective member 18 about the shaft 26.
15

The base member 10 has a flanged hollow spigot 50 secured by its flange to the flat upper wall 12 so as to project through an opening in the flat lower wall 14 of the housing 16. A cylindrical wall 52, formed integrally with the housing 16, surrounds the stud 50 so as to form a pivot bearing. A pinion 54 is journaled on the stud 50 above the cylindrical wall 52. The upper face of the pinion 54 carries detent formations 56 which are adapted to engage with complementary formations on a cap 58 which is
20 rotationally fast with the stud 50. A compression spring 60 urges the detent formations 56 and the cap 58 into engagement with one another. The pinion 54 is engaged by a worm gear 62 secured to the output shaft 64 of the second motor 36. Thus, rotation of the shaft 64 causes angular
25 movement of the housing 16 relative to the base member 10.
30

If the housing 16 is subject to impact from the front or rear, the detent formations 56 disengage from the complementary formations on the cap 58, allowing the housing 16 to fold backwards or forwards against the side
35 of a vehicle on which the mirror is mounted.

Figure 3 is a block diagram of a control system for the motors 34 and 36. The control system comprises a

controller 70 which produces control signals to operate the motors 34 and 36, each of which has associated therewith a respective counter 72, 74 for supplying a signal to the controller 70 indicating the number of revolutions made by the corresponding motor 34, 36.

In order to adjust the mirror in the up/down direction, the controller 70 has an "Up" push button 76 and a "Down" push button 78. The motor 34 rotates in the appropriate direction for as long as either of these push buttons is depressed so as to tilt the mirror carrier 20 at a rate of about 3° per second. Similarly, the controller 70 has "Left" and "Right" push buttons 80 and 82 for causing the controller to send appropriate signals to the motor 36 to cause angular movement of the housing 16 about the spigot 50, once again at a rate of about 3° per second. This permits the orientation of the mirror carrier to be adjusted to provide the required field of view depending on the driver's seating position in the vehicle.

When it is desired to drive the mirror housing 16 to a parked position in which it is folded against the side of the vehicle, a "Park" button 84 on the controller is pressed. This causes the controller to drive the motor 36 at a speed such as to cause angular movement of the housing 16 about the spigot 50 at a rate of about 30° per second. At the same time, the controller counts the output produced by the counter 74 to determine the number of revolutions performed by the motor 36 to move the housing 16 until it abuts against a stop (not shown), thus causing the motor 36 to stall. The resulting rise in current is sensed by the controller which then disconnects the supply to the motor 36.

When it is desired to restore the mirror from its parked position to its deployed position, a "Restore" push button 86 on the controller 70 is pressed. The controller then supplies electric current to the motor 36, so as to cause it to rotate in the opposite direction until the counter 74 indicates that the same number of revolutions

have been performed as was necessary to move the mirror head 16 from its deployed position to its parked position.

The controller 70 also receives an input from the gear selector 88 of the vehicle, indicating the engagement of reverse gear. This causes the controller 70 to supply current to the motor 34 to cause it to tilt the mirror carrier downwardly at a rate of about 30° per second until it abuts against a stop (not shown) located so that the field of view of the mirror includes the ground adjacent to the corresponding rear wheel of the vehicle. The counter 72 provides a signal to the controller 70 indicating the number of revolutions of the motor 34 necessary to perform this tilting movement. When the mirror carrier reaches this stop, the motor 34 stalls and the resulting increase in current is detected by the controller 70 which then disconnects the electrical supply to the motor 34. When reverse gear is disengaged, the controller 70 causes the motor 34 to rotate in the opposite direction until the counter 72 indicates that the same number of revolutions have been performed as were necessary to move the mirror to its tilted position.

A comparator 90 is arranged to receive a signal from an ambient photocell 92 indicating the level of ambient light outside the vehicle. The comparator 90 also receives a signal from a rear photocell 94 indicating the level of light incident on the mirror from the rear of the vehicle. When the level of light indicated by the ambient photocell 92 indicates lack of daylight and the rear photocell 94 indicates a light level which exceeds that detected by the ambient photocell 92 by more than a predetermined amount e.g. because the driver of a following vehicle has failed to dip his headlights, the comparator 90 sends a signal to the controller 70, causing the motor 34 to tilt the mirror carrier 20 downwardly until the counter 72 indicates that the number of revolutions performed is sufficient to tilt the mirror carrier 20 through an angle equal to the angle between the front and

rear surfaces of the prism 18. The driver now sees a dimmer image reflected from the front surface of the prism 18 rather than a bright image reflected from the reflective layer on the rear surface thereof. To avoid repeated rapid movement of the mirror between its tilted position and its normal position, the controller 70 causes the motor 34 to tilt the mirror carrier 20 back to its normal deployed position only when the difference in light levels between the two photocells 92 and 94 has been less than the above mentioned threshold for at least ten seconds. When this occurs, the motor 34 is run until the counter 72 indicates that the number of revolutions equivalent to the prism angle have been performed.

The controller 70 may include a memory adapted to store information identifying one or more desired deployed positions for the reflective member 18.

CLAIMS

1. An exterior rear view mirror for a vehicle comprising a base for mounting on a vehicle body, a housing pivotally mounted on the base for angular movement about a first pivot axis, a reflective member mounted in the housing, an electric motor having an output shaft arranged to cause angular movement of the housing about the first pivot axis, and a controller adapted to control the electric motor so as to selectively drive the housing about the first axis either at a first speed or at a second speed which is faster than the first speed.
2. An exterior rear view mirror according to claim 1, wherein the controller includes measuring means for determining the angle through which the housing has been moved.
3. An exterior rear view mirror according to claim 2, wherein the measuring means comprises a counter for counting the number of revolutions of the output shaft of the motor.
4. An exterior rear view mirror according to claim 3, wherein the second speed is at least five times as fast as the first speed.
5. An exterior rear view mirror according to claim 4, wherein the second speed is at least ten times as fast as the first speed.
6. An exterior rear view mirror according to claim 1, wherein the second speed is at least five times as fast as the first speed.
7. An exterior rear view mirror according to claim 6, wherein the second speed is at least ten times as fast as the first speed.
8. An exterior rear view mirror according to claim 1, wherein the reflective member is pivotally mounted in the housing for angular movement relative thereto about a second pivot axis and a second electric motor has an output shaft arranged to adjust the reflective member in altitude relative to the housing and the controller is adapted to

control the second electric motor.

9. An exterior rear view mirror according to claim 8, wherein the controller includes measuring means for determining the angle through which the reflective member has been moved.

10. An exterior rear view mirror according to claim 9, wherein the measuring means comprises a second counter for counting the number of revolutions of the output shaft of the second motor.

11. An exterior rear view mirror according to claim 9, wherein the reflective member has a first reflective surface having a first reflectivity and a second reflective surface having a second reflectivity greater than the reflectivity of the first reflective surface and disposed at a predetermined angle to the first surface, and the controller is arranged to determine when the reflective member has been tilted through an angle equal to said predetermined angle.

12. An exterior rear view mirror according to claim 11, wherein the controller includes first and second light sensors response respectively to ambient light and to light incident on the reflective member and arranged to tilt reflective member through an angle equal to said predetermined angle when the difference in the light levels sensed by the two sensors exceeds a predetermined amount.

13. An exterior rear view mirror according to claim 8, wherein the controller is linked to a vehicle gear selector so as to tilt the reflective member downwardly when reverse gear is engaged and the controller is arranged to sense the angle through which the reflective member has been tilted from its deployed position and to drive the reflective member back through this angle when reverse gear is deselected.

14. An exterior rear view mirror according to claim 9, wherein the controller is linked to a vehicle gear selector so as to tilt the reflective member downwardly when reverse gear is engaged and the controller is arranged to sense the

angle through which the reflective member has been tilted from its deployed position and to drive the reflective member back through this angle when reverse gear is deselected.

- 5 15. An exterior rear view mirror according to claim 11, wherein the controller is linked to a vehicle gear selector so as to tilt the reflective member downwardly when reverse gear is engaged and the controller is arranged to sense the angle through which the reflective member has
- 10 been tilted from its deployed position and to drive the reflective member back through this angle when reverse gear is deselected.

ABSTRACT OF THE DISCLOSURE

EXTERIOR MIRROR FOR MOTOR VEHICLE

5 An exterior rear view mirror for a vehicle has a housing pivotally mounted on a base for angular movement about a first pivot axis and an electric motor for causing such movement. A controller operates the motor at either of two different speeds. The controller includes a counter for counting the number of revolutions of the output shaft of the motor so as to determining the angle through which
10 the housing has been moved, thus enabling the housing to be restored to its original position by causing the motor to perform the same number of revolutions in the opposite direction.

Fig. 2.

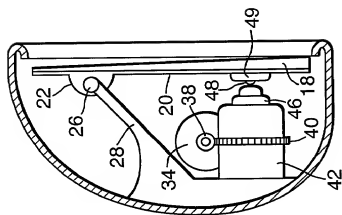


Fig.1.

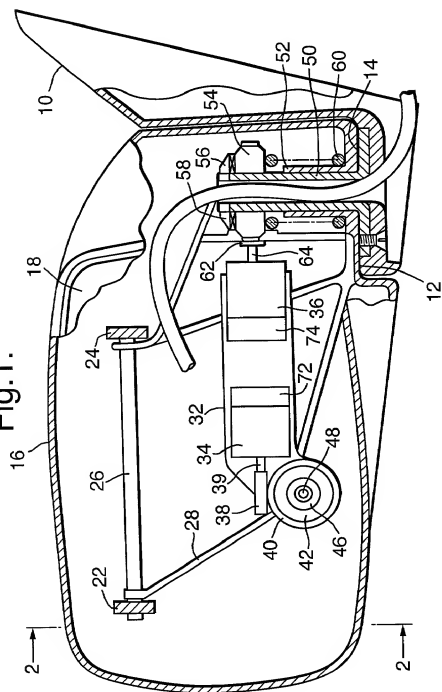
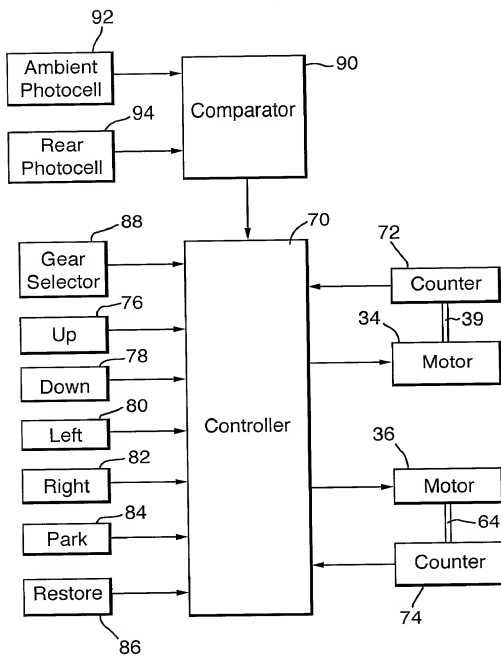


Fig.3.



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MIRROR
EXTERIOR FOR MOTOR VEHICLE

the specification of which (check one)

☒ is attached hereto.

☐ was filed on _____ as Application
Serial No. _____ and was amended on
_____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

Priority Claim

(Number)	(Country)	(Day/Month/Year filed)	Yes	No
9914420.6	GB	22, 06. 1999	x	
(Number)	(Country)	(Day/Month/Year filed)	Yes	No
(Number)	(Country)	(Day/Month/Year filed)	Yes	No

DECLARATION AND POWER OF ATTORNEY

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States Provisional application(s) listed below:

PRIOR PROVISIONAL APPLICATIONS

(application serial number)

(Month / Day / Year filed)

(application serial number)

(Month / Day / Year filed)

I hereby claim the benefit under Title 35, United States Code, section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.

Filing Date

Status - patented,
pending, abandoned

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint **Richard L. Carlson**, Reg. No. 27863, and each principal, attorney of counsel, associate and employee of Harness, Dickey & Pierce, P.L.C., who is a registered Patent Attorney, my attorney with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. I request the Patent and Trademark Office to direct all correspondence and telephone calls relative to this application to Harness, Dickey & Pierce, P.L.C., P. O. Box 828, Bloomfield Hills, Michigan 48303 (810) 641-1600.

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Inventor's signature: *Bernard Duroux*

Date: 05/ June 2000

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DECLARATION AND POWER OF ATTORNEY

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Second Inventor's signature: [Signature]

Date: 5 juin 2000

Residence: 19 rue Rosa Bonheur, 77250 Veneux les Sablons, France.

Citizenship: French

Post Office Address: As residence

Full name of third joint inventor, if any: _____

Third Inventor's signature: _____

Date: _____

Residence: _____

Citizenship: _____

Post Office Address: _____

Full name of fourth joint inventor, if any: _____

Fourth Inventor's signature: _____

Date: _____

Residence: _____

Citizenship: _____

Post Office Address: _____

Full name of fifth joint inventor, if any: _____

Fifth Inventor's signature: _____

Date: _____

Residence: _____

Citizenship: _____

Post Office Address: _____